

Application No. 09/890,550

Docket No. 2000-22

Amendment

Response to Office Action dated May 18, 2004

REMARKS

The foregoing amendments and these remarks are in response to the Final Office Action dated May 18, 2004. This amendment is accompanied by a Request for Continued Examination and a request for a retroactive extension of time.

At the time of the Office Action, claims 43-49 were pending in the application. In the Office Action, claims 43-49 were rejected as being unpatentable over U.S. Patent No. 5,534,328 to Ashmead et al. ("hereinafter Ashmead") in view of U.S. Patent No. 4,846,683 to Tsukada and U.S. Patent No. 5,964,646 to Kassir et al. ("hereinafter Kassir").

Claims 43 and 47 are amended herein based on the specification of the present application at page 12, line 19. New claims 50 and 52 are added based on the present specification in Fig. 1. New claims 51 and 54 are added based on the present specification at page 45, lines 20-21.

Amended claims 43 and 47 are directed to a wafer grinder table (2) including a plurality of base materials (11A, 11B), each of which is a ceramic-metal composite formed by impregnating metal silicon in opened bores of a porous body made of silicon-containing ceramic. Notably, the ceramic-metal composite has a thermal conductivity of  $100 \text{ W/m} \cdot \text{K}$  or more, which improves the bond strength or the bonding ability between the bonding layer (14) and the base materials (claim 43) and improves the bond strength or the bonding ability of the bonded base materials (claim 47). Furthermore, by flowing water through the passage (12), the heat produced when grinding semiconductor wafers (5) is directly and efficiently released from the table (2), so that the temperature difference in the table (2) is very small and the thermal uniformity and thermal response are improved.

In contrast, Ashmead is directed to an integrated chemical processing apparatus including laminae, or wafers, and a three-dimensionally tortuous channel. However, Ashmead does not teach or suggest the plurality of bonded base materials, each formed from a silicon carbide-metal composite having a thermal conductivity of  $100 \text{ W/m} \cdot \text{K}$  or more, as claimed in the present application. As noted by the Examiner, nowhere in Ashmead is the use of a ceramic-metal composite contemplated for the laminae. Furthermore, Ashmead is not directed to a wafer grinder table but to a structure within whose channels chemicals are mixed and reacted.

Tsukada discloses impregnating metal silicon in opened bores of a porous body. However, Tsukada does not teach or suggest the plurality of bonded base materials, each formed

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from a silicon carbide-metal composite having a thermal conductivity of 100W/m • K or more, as required in the amended claims.

Kassir is directed to a grinding apparatus having a resilient pad (26) used to grind a wafer. However, the resilient pad (26) is not made of a ceramic-metal composite formed by impregnating metal silicon in opened bores of a porous body made of silicon-containing ceramic, but instead is formed of a polyester material such as MYLAR that is perforated to allow a vacuum to temporarily affix the wafer to the pad. Thus, Kassir does not teach or suggest the use of a porous ceramic material as the grinding surface, but rather as a support on which a resilient pad is held.

For the foregoing reasons, applicant believes that claims 43 and 47 are not obvious over Ashmead in view of Tsukada and Kassir, and are thus in condition for allowance. In particular, none of the cited prior art documents, either individually or in combination, teaches the use of bonded base materials, each formed from a silicon carbide-metal composite having a thermal conductivity of 100 W/m • K or more. A combination of these document would thus not result in a wafer grinder table having all of the limitations of independent claim 43 or 47. The dependent claims are believed allowable because of their dependence upon an allowable base claim and because of the further features recited.

Applicant has made every effort to present claims which distinguish over the prior art, and it is believed that all claims are in condition for allowance. Nevertheless, Applicant invites the Examiner to call the undersigned if it is believed that a telephonic interview would expedite the prosecution of the application to an allowance. In view of the foregoing remarks, Applicant respectfully requests reconsideration and prompt allowance of the pending claims.

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Respectfully submitted,

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Docket No. 2000-22